CLASS OF 65 NEWSLETTER

EDITION 7 – August 2008

Disclaimer: This Newsletter is produced for members of the RMC Class of 1965 and is based solely on inputs from members of the Class of 65. It is not an official publication of the Royal Military College nor does it purport to represent the views or opinions of all members of the Class of 65. Articles will be entered in the official language in which they are received. Regrettably the Editorial staff still lacks the linguistic skills to produce a bilingual version.

Editor's Corner

It's time to continue **Rick Johnson's** epic love affair with the venerable Hercules. We left him in Edition 4 reminiscing about a number of tragic accidents with the aircraft – a rather *a propos* tie in with my love affair analogy! We'll complete this saga in a later issue with the suggestion to Rick that there is material here for a book rather than wasting his considerable talents for free on this newsletter.

Mike Houghton also brings us up to date on his life since graduation. It seems that he has maintained the exuberance and *joie de vivre* that he exhibited at RMC. The attached pictures attest to that.

On 11 July about 150 ex-Cadets in the Ottawa region gathered at Hylands golf course for the annual golf tournament. Eight members of the Class of 65 participated with varying degrees of skill and enthusiasm – Ken **Clarkson, Charlie Emond, Gord Diamond, Pete Cooke, Fats Carruthers, Rick Archer, Peter Houliston** and yours truly. No skill prizes were won this year by the 65'ers, however, the fearsome foursome of the last four named above, birdied their last hole to end up with even par, a six shot improvement over last year. Errant shooting aside, the weather cooperated and a good time was had by all.

The Herc & I (Part II)

By 6544 Rick Johnson

Navigation Aids

The navigation equipment on the aircraft consisted of a ground-mapping radar (which did double-duty as a weather avoidance radar too,) a Doppler system that provided drift and ground speed readings, and which was also coupled to an along and across track computer, a Loran-A receiver that was eventually replaced with an Omega navigation system, an Automatic

Direction Finder (ADF) for taking radio bearings, a radar altimeter for measuring absolute altitude, and a sextant for taking sightings on the sun, moon and stars for heading checks, and for lines of position or fixes.

The APN-59 radar made a pretty good ground mapping radar, and you could adjust the range display from about 100 miles down to about 1 mile. There were many times when we were landing at the DEW line (Distant Early Warning) radar sites where this radar was the best approach aid available, and it would be the navigator's responsibility to 'talk' the pilot through the approach, giving him turn instructions and distance-to-go information. I always liked the feeling of security it gave me because I could 'see' where the aircraft was, without having to rely on mentally interpreting bearings from navigation aids. When making an approach to an airport surrounded by high terrain in the dark, or in poor weather, it was really nice to know where the hell you were. Although the radar could be used to obtain a fix, we didn't use it all that much... it was more often used just to provide confirmation that you were in the right general area. It's primary function when in cruising flight was for weather avoidance. The antenna was split into an upper and lower section, and the lower part could be rotated to change from a 'fan beam' antenna used for mapping, and a 'pencil beam' antenna used for weather avoidance. The Herc didn't fly as high as jets, it typically cruised along around 20-25,000 ft, so we were rarely able to fly over the weather. This meant that during the summer the nav would usually be stuck with his face up against the hood over the radar screen, figuring out which way to go to avoid the worst of the CB's. I found this rather a stressful job.

Loran A was not a bad navigation aid, provided that you were not in cloud. If you were, then there was so much static that it was impossible to pick out the signal from the noise. Developed during WW2, Loran was a radio navigation system that worked by having two transmitters a few hundred miles apart. The master would emit a pulse at a particular frequency, and the slave station would re-transmit the signal. By measuring the time delay between receipt of the master signal and the slave signal, you could obtain a line of position. Do this with two or more station-pairs, and you could get a good fix. The process of measuring the time differences was done using an oscilloscope. The grid of position lines was printed on the back of our plotting charts, and we used a light table so that they would show up only when they were needed. You could estimate what the time

difference ought to be for your position, and have the approximate value already dialed in, making the taking of a final reading quite simple.

Doppler was one of the most useful navigation tools, because it could tell you your ground speed and drift. The system works by transmitting a signal ahead of the aircraft, and measuring the change of frequency between the transmitted signal and its reflection...the frequency shift is directly proportional to the speed of the aircraft. The system used on the Herc actually transmitted four beams...two ahead and two behind. By rotating the antenna so that the frequency shift between diagonally opposed pairs of beams was equalized, you could align the antenna precisely with the direction of the aircraft over the ground, and thus determine the drift angle, while at the same time doubling the accuracy of the ground speed reading. About the only time this system failed was when you were over calm water ("smooth sea") --under these conditions there was not sufficient reflection of the signal.

Eventually the Doppler was coupled to an 'along and across track computer'...you would set in the desired track angle and distance to go, and it would then give you a constant reading of how many miles were left to go to the next waypoint, and how far left or right you were of the desired track. This in turn was coupled with the autopilot, making it possible for the navigator to control the direction of the aircraft without having to pass heading changes to the pilot. This was great, because pilots did not like changes of heading of one degree...some would complain that the aircraft could not be steered that accurately, making it necessary to alter heading 3 degrees in one direction, and then a few minutes later alter heading 2 degrees in the opposite direction in order to achieve the desired 1 degree heading change!

The radar altimeter was used to ensure that we were at the correct altitude during approach --it would be the navigator's responsibility to call 1,000 ft above ground and give the drift angle during each approach to landing. The radar altimeter was also used for navigation using a technique called "pressure pattern". The theory behind this was that wind blows from areas of high pressure to areas of low pressure at a speed that is proportional to the rate of change (or gradient) of the pressure level. Since an aircraft typically flies at a constant pressure altitude, if you were to measure the change in altitude of this pressure level above sea level, then you could figure out the cross-wind component of the wind and hence tell how far you should have drifted left or right of your actual

true heading between readings. I know, it sounds preposterous. When we were first introduced to the concept at navigation school I thought it was something left over from the days of Charles Lindbergh. When it was reviewed during the Hercules Operational Training Unit course I was equally inclined to believe that I would never make use of it. Then one day I ran into a situation where it was the only available navigation aid for almost two hours, and on that day I became a believer! We had left Shannon on a flight to Ottawa, and of course not long after we had reached top of climb we were out of range of the closest VOR radio beacon. Then we ran into cloud, making the Loran useless because of the precipitation static which drowned out the Loran signals. It also made it impossible to take heading check and lines of position using the sun. Then the Doppler clicked into "smooth sea mode"...the only thing left was pressure pattern, and so for the next two hours, until we came out of the cloud, that was all I had to rely on. When at last I was able to get a reliable fix I was surprised to find that I was right where I thought I was...pressure pattern actually worked!

During my second tour on squadron, the aircraft had been fitted with Omega navigation systems. This was a very low frequency radio navigation aid that involved 8 transmitter sites that were located around the globe. It had been developed for the US Navy's submarine fleet, and it was much better than the Loran A that it replaced. Loran A was being withdrawn from service, and had only ever had a limited area of operation...Omega on the other hand, was global in its coverage. It was also the first true electronic navigation computer we had had on board...the Doppler along and across track computer, by contrast, was a purely mechanical device that depended on cogs and wheels to solve its navigation problems. Omega was digital. It would figure out what stations it was receiving and then determine where you were, to an accuracy of approximately one mile, which was considerably better than anything we had ever had before.

The sextant was a vital piece of navigation equipment that was used on every trip other than short airways flights. It was used for heading checks, and to obtain lines of position. You could take a heading check using the sun, moon, or stars, depending on what was visible. The sun was the first choice, of course. The theory behind taking a line of position relied on the fact that the sun and the stars are so far away from us that their light can be assumed to be reaching us in parallel rays. If you know the point on the earth that is directly below the star, then the angle of

the star above the local horizon is an accurate measure of how far you are from the "sub stellar point". Hence, by observing the altitude of three stars, preferably separated by 120 degrees of azimuth (direction), you could create a fix. On oceanic flights this was our primary, most reliable means of fixing our position, and it was not uncommon to plan over-water flights to be at night for this reason.

Even when we were not flying at night, it was common practice to take a heading check and a sun position line at least once per hour. The moon was used less frequently because it was more awkward. First, because it is rarely a full disc, and never just a single point of light, it is more difficult to keep centred in the viewfinder of the sextant. Secondly, since it is relatively close to the Earth, its' light can not be assumed to be parallel, and so you have to take into account a parallax error, making the calculations somewhat more complicated, and thus more prone to mistakes.

The sextant used a bubble to enable the user to establish the local horizon. You could control the size of the bubble so that it could comfortably surround whatever you were "shooting". The idea was to keep the crosshairs, the bubble, and your target all lined up. A small knob on the side of the sextant allowed you to control the vertical look angle. Since the aircraft rarely flew smoothly and straight enough for you to take an "instantaneous" shot, there was a mechanism that allowed you to track the shot for two minutes, and it would then mechanically average the 'altitude' (or 'height-sextant"). The Herc was not a bad astro platform, but it did tend to fly a bit of a corkscrew, so the averaging was always a requirement. The best aircraft I ever flew in this regard was the Cosmopolitan...it was as steady as a rock, and once you had things lined up, that's where they stayed.

A three star fix would typically take about 20 minutes work. First you had to estimate where you were going to be, then you had to figure out which stars would be visible, and do all the calculations that tell you which direction and angle to look. Then you would have to apply these values to the sextant and check to see that you could find the first star. You would warn the pilots before you started taking the shot so that they would de-couple the autopilot from any nav system so that the aircraft would remain flying straight and level. Each shot would take two minutes, which would be taken four minutes apart. Once the shots had been taken and the values recorded, you would have to figure out the values to plot, and

then draw them on the plotting chart. If everything worked out, you would wind up with a nice neat "cocked hat". A perfect fix would have all three lines of position intersecting at the same point. More often they would form a triangle...the smaller the better. Typical accuracy of a three star fix would be about 5-10 miles. If it was cloudy, or bumpy, the accuracy could be a lot worse.

RMC to Retirement

By 6475 Michael Houghton

As we approach that magic moment when with great excitement and anticipation we all accept our entry into the Old Brigade (I always thought OB meant you were about to use your driver for your third shot having never left the tee), I can honestly say that life has been anything but dull in the Houghton family. Having always wanted to be a soldier, but failed to get past Private (Gunner) in my High School Cadet Corps, and failed to get past Private in my Militia Regiment, maybe RMC and a Commission would work. 35 years later I found myself looking back at working and serving with some of the most talented, loyal and dedicated individuals this country of ours has to offer. From platoon commander with first posting to Germany, to command of a mechanized battalion again in Germany, to command of the Canadian Airborne Regiment – what more could a soldier wish for?? Postings every 1 to 3 years (sadly, much to the discomfort of my first wife, Lois) took me to every Province and Territory in Canada, Germany for a total of 6 years, Australia for 2 years, and as Director Peacekeeping Operations to just about every hot spot in the world, including such vacation destinations as Angola, Somalia, Haiti and Yugoslavia.

Before

One anecdote reflects for me the huge value in attending CMR/RMC. As an infantry officer, one of the expectations was that you became a paratrooper as quickly as possible. With my initial posting to Germany, this was not to be and I had to endure (quietly with gritted teeth, I might add) considerable merriment at my expense from my brother officers for the first three years of commissioning. At one point they even tried to get me qualified by throwing me 3 times out of the back of

a ¾ ton truck at night, moving across rough terrain at 35 km/hr. I think we all got a week's worth of extra orderly officer for that particular exercise. Oh well, seemed like a good idea at the time. Understandably, upon my return to Canada, I marched straight into the Career Manager and threatened him with great bodily harm if he denied me the first para course scheduled. Now at this point, I must add that I suffer from vertigo (having once had the urge to throw myself off the Peace Tower and, no, I had not been drinking), and the thought of throwing one self out of a perfectly serviceable airplane seemed somewhat ludicrous. In short, I was terrified. However, came the actual jump stage in the Course, who did I find piloting the Herc – none other than Gerrit Van Boeschoten. For some unexplained reason, I suddenly had confidence in the system and, of course, could not let a fellow classmate down. My very next posting was to the Airborne Regiment in Edmonton where I developed my dream to some day command the Regiment. Although Van is no longer with us, I will always be indebted to him. Many such examples occurred throughout my military career, in particular the opportunity to work with classmates from all three environments both in the air and at sea during joint operations.

Following retirement, I was recruited by Coopers & Lybrand Consulting to participate in facilitating the downsizing of one of our federal government departments. I was handed a laptop and told that we now live in a paperless world, and that all correspondence would be done electronically. Now one must understand that as a Colonel with a fairly large staff in National Defence Headquarters, I couldn't even spell "electronic" let alone find the "ON" button of the laptop!!! (Wrote a sup in Electricity in CMR – stupid subject, and who needs it anyway?) Needless to say the learning curve was somewhat steep and, once again, I had the privilege of working with a host of extremely talented corporate business men and women. While the initial contract was for one year, there followed ten years of a series of contracts with Price Waterhouse, Coopers and IBM, both short and long, in which I focussed on facilitation, coaching, efficiency analysis and implementation, and finally project management in health policy formulation.

My personal life has also been somewhat challenging in that my first wife of 29 years decided she wished to be on her own just as I was retiring. This had a good ending, though, as I then met my second wife, Dee, whom many of you will have met at our last reunion. (One of my reasons for

picking CMR was to meet a French Canadian girl, thereby facilitating the learning of French. In the early 60's, of course, this was next to impossible given the Quiet Revolution, so had to wait 30 years to realize that aim, Dee being a product of Rouyn Noranda). Dee sadly passed away November 2006 at 46 years of age following 11 years of very special time together. At the moment, I have two daughters from my first marriage and a step-son from my second marriage, with 3 grandchildren and another expected this coming December. I am, indeed, a very lucky man.

After

So life is good and, using Dee as my inspiration, I intend to live every day as if it were my last. A new relationship is blossoming, my family is healthy, I can still beat the poop out of several 35 year olds at Squash (even if I do need a week to recover), golf is always available and alpine skiing is only a few months away!! What more could a man want!!

I look forward to seeing all of you at any time, but certainly in 2010, and hope that you are all enjoying life as much as I am.

TDV

Closing Notes

If you have sent stuff in to me and it hasn't appeared in print, fear not, you have not been edited out – just scheduled for a later edition. Thanks again to contributors past, present and future. Next time we'll hear from **Roger Chiasson** and his days as a pin-striper (diplomat, not nurse!), and **Yvan Gagnon** will share a bit of historical information that will be of interest to those of the light blue persuasion and others with a love of flying.

I gather there is news coming soon that will clarify our class status with respect to the Old Brigade. I must confess to a certain ambiguity toward the honour as I try to cling to some remaining vestiges of youth. How time has passed!